CLAIMS

1. A method for growing a thin nitride film over a substrate, comprising carrying out a low temperature process using a solution to thereby control the polarity of the thin nitride film.

2. The method for growing a thin nitride film over a substrate according to claim 1, wherein the substrate is a sapphire substrate, and wherein the low temperature process comprises subjecting the sapphire substrate to H_2 cleaning and treating the cleaned sapphire substrate with an acidic solution.

3. The method for growing a thin nitride film over a substrate according to claim 2, wherein the acidic solution is nitric acid.

4. The method for growing a thin nitride film over a substrate according to claim 1, comprising the steps of subjecting the substrate to H_2 cleaning, forming a mask, and treating the cleaned substrate with a solution through the mask to thereby form patterned regions having different polarities in the thin nitride film.

5. A thin nitride film device formed by the method for growing a thin nitride film over a substrate according to claim 1.

6. The thin nitride film device according to claim 5, comprising a c face sapphire (Al_2O_3) substrate, a Ga face and

a N face arranged over the c face sapphire (Al_2O_3) substrate, the Ga face growing in +c face, and the N face growing in -c face.

7. The thin nitride film device according to claim 5, as a device comprising a separated element and/or a device having a periodically patterned surface.